

Course Information								
Course Code	T	P	L	C	ECTS	Type C/E	Language TR/ENG etc.	Year/Semester
CHEM2124	4	0	0	4	5	C	TR	1/SPRING
Course Name (Turkish)	Analitik Kimya Laboratuvarı II							
Course Name (English)	Analytical Chemistry Laboratory II							

Unit/Program	Chemistry Department/Undergraduate Program
Course Prerequisite	No
Course Objectives	The aim of this course is to teach students the methods used to quantitatively elucidate the composition of substances and to provide them with the opportunity to practice in order to develop their laboratory skills in this subject.
Course Outline	Gravimetrik Tayinler / Mn ²⁺ tayini / Fe ²⁺ tayini Volumetrik Tayinler / Nötralizasyon titrasyonları / OH ⁻ -CO ₃ ²⁻ karışımının analizi / Alkalimetri / H ₃ PO ₄ -NaHPO ₄ karışımlarının analizi / Redoks titrasyonları / manganometri / Mn ²⁺ tayini / NO ₃ ⁻ tayini / İyodometri / Cr ₂ O ₇ ²⁻ tayini / Aktif Klor tayini / Bromometri / As(III) tayini / Dikromat titrasyonları/Fe ²⁺ -Fe ³⁺ karışımının tayini / Çöktürme titrasyonları / Br ⁻ tayini / Kompleksometri / Mg(II) - Zn(II) karışımının tayini / Fe(III) - Al(III) karışımının tayini / SO ₄ ²⁻ tayini / Doğal katı örneklerin kantitatif analizi
Textbook/ Material / Resources	GUNDUZ, Turgut, Quantitative Analysis Laboratory Book, Bilge Publishing House, Ankara, 1989
Internship Status	No

Course Precedents				
University Name	Program Name	Course Name	T-P-L-C; ECTS	Type
Gazi University	Chemistry	Analytical Chemistry Laboratory II	0-0-6-2- 4	C
Yıldız Teknik University	Chemistry	Analytical Chemistry Laboratory II	0-0-6-3- 5	C
Hacettepe University	Chemistry	Analytical Chemistry Laboratory II	0-0-6-2- 4	C
The instructor who proposed the course (Title, Name and Surname)			Signature	
Prof. Dr. Habibe Özmen				
Instructors who can teach the course (Title, Name and Surname)			Signature	
Prof. Dr. Ali Ölçücü, Prof. Dr. Mehmet Yaman				

Academic justification for the opening of the course? (The effect of course outcomes on program outcomes, etc.)
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Brief explanation of the course (theoretical lecture, applications, laboratory, studio, off-campus activity, using software, etc.)

External Stakeholder Opinions About the Course (It is expected that the opinions to be obtained from the business world that will employ your graduates or from real or legal persons outside the University who have expertise on the subject of the course will be specified. Proof documents must be attached to this form.)	
Stakeholder Name	Opinion (It should be given as a summary, it should not exceed two lines.)

Weekly Course Content Distribution		
Week	Theory	Application/Laboratory
1		Preparation of Acidic and Basic Washing Solutions, Cleaning of Glassware
2		Gravimetric Determinations / Determination of Ba ²⁺
3		Gravimetric Determinations / Determination of SO ₄ ²⁻
4		Volumetric Determinations / Neutralization titrations / Analysis of OH ⁻ – CO ₃ ²⁻ mixtures
5		Volumetric Determinations / Neutralization titrations / Analysis of H ₃ PO ₄ -NaHPO ₄ mixtures
6		Redox titrations / Determination of Mn ²⁺ / Determination of NO ₃ ⁻
7		Iodometry / Determination of Cr ₂ O ₇ ²⁻ / Determination of Active Chlorine
8		Dichromate titrations / Determination of Fe ²⁺ -Fe ³⁺ mixture
9		Precipitation titrations / Determination of Br ⁻
10		Complexometry / Determination of Mg (II) - Zn (II) / Fe(III)-Al(III) mixture
11		Complexometry / Determination of SO ₄ ²⁻
12		Determination of Water Hardness with EDTA
13		Chromium in Chromite Ores Quantification
14		Make-up tests
15		Make-up tests

Assessment			
Evaluation Criteria	Activity	Custom	Contribution to Success Grade (%)
	Midterm Exams		
	Quizzes	7	20
	Assignments		
	Projects		
	Term Paper		
	Laboratory	9	20
	Other		
	Final Exam	1	60
		Sum:	100
Remarks			

Content Design and Subject Weight (%)	Mathematics and Basic Sciences	100
	Engineering Sciences	
	Social Sciences	
	Health Sciences	
	Educational Sciences	
	Culture and Art Sciences	
	Design Information	

Workload (ECTS) Calculation			
Events	Number	Duration (Hours)	Total workload (Hours)
Fieldwork			
Midterm Exam Application	10	1	10
Self-Study (including pre-class and exam preparation)	1	2	2
Make-up Exam			
Experiment and Observation			
Class Participation (Theory)			
Homework	1	2	2
Final Exam Practice	14	4	56
Laboratory			
Article Review			
Writing an Article	10	1	10
Reading			
Case Study			
Performance			
Problem Solution			
Project Preparation			
Project Submission			
Quiz	7	1	7
Report Preparation	9	2	18
Submitting Reports			
Role/Drama Work			
Seminar			
Oral Exam			
Team/Group Work			
Argument			
Application/Practice			
Other			
TOTAL WORKLOAD:			105
ECTS CREDITS OF THE COURSE: (The number obtained as a result of Total Workload/25 is calculated by rounding to the whole number.)			4

		Program Outcomes (PO)										
Learning Outcomes (LO) (Course Outcomes)		1	2	3	4	5	6	7	8	9	10	11
1	Prepare neutralization titrations, primary and secondary standards, standardization, and adjusted acid and base solutions.	5	5	5	3	1	4	4	2	2	2	1
2	Knows precipitation titrations and back titrations and evaluates the obtained results.	5	5	5	3	1	4	4	2	2	2	1
3	Knows how to perform redox titrations and evaluate their results	5	5	5	3	1	4	4	2	2	2	1
4	Knows complexometric titrations and how to evaluate their results.	5	5	5	3	1	4	4	2	2	2	1
5	It reaches the unknown amount of sample in the sample by gravimetric method.	5	5	5	3	1	4	4	2	2	2	1

Course Information								
Course Code	T	P	L	C	ECTS	Type C/E	Language TR/ENG etc.	Year/Semester
CHEM2126	2	0	0	2	4	C	TR	1/SPRING
Course Name (Turkish)	Organik Reaksiyon Mekanizmaları							
Course Name (English)	Organic Reaction Mechanisms							

Unit/Program	Chemistry Department/Undergraduate Program			
Course Prerequisite	No			
Course Objectives	To classify organic reactions and to ensure that the structure-reactivity relationship is understood and comprehended.			
Course Outline	1. Nucleophilic substitution reactions 2. Dissociation reactions 3. Electrophilic and nucleophilic addition reactions 4. Aromatic electrophilic substitution reactions			
Textbook/ Material / Resources	1. M.Balci, Reaction Mechanisms, TÜBA, 2008 2. O.Anaç, E.N.Tahınlı, Organic Reaction Mechanisms, İTÜ, 2008			
Internship Status	No			
Course Precedents				
University Name	Program Name	Course Name	T-P-L-C; ECTS	Type
Ondokuz Mayıs University	Chemistry	Organic Reaction Mechanisms	2-0-0-2-4	C
Karadeniz Teknik University	Chemistry	Introduction to Organic Reaction Mechanisms	2-0-0-2-4	C
Eskişehir Osmangazi University	Chemistry	Organic Reaction Mechanisms	2-0-0-2-4	C
The instructor who proposed the course (Title, Name and Surname)			Signature	
Prof. Dr. Ahmet CANSIZ				
Instructors who can teach the course (Title, Name and Surname)			Signature	
Prof. Dr. Süleyman SERVİ, Prof. Dr. Hülya TUNCER, Prof. Dr. Metin KOPARIR, Doç. Dr. Demet COŞKUN				

Academic justification for the opening of the course? (The effect of course outcomes on program outcomes, etc.)
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Brief explanation of the course (theoretical lecture, applications, laboratory, studio, off-campus activity, using software, etc.)

External Stakeholder Opinions About the Course (It is expected that the opinions to be obtained from the business world that will employ your graduates or from real or legal persons outside the University who have expertise on the subject of the course will be specified. Proof documents must be attached to this form.)	
Stakeholder Name	Opinion (It should be given as a summary, it should not exceed two lines.)

Weekly Course Content Distribution		
Week	Theory	Application/Laboratory
1	1st Order Nucleophilic Substitution Reactions-1 (SN1)	
2	1st Order Nucleophilic Substitution Reactions-2 (SN1)	
3	2nd Order Nucleophilic Substitution Reactions-1 (SN2)	
4	2nd Order Nucleophilic Substitution Reactions-2 (SN2)	
5	1st Order Dissociation Reactions (E1)	
6	2nd Order Dissociation Reactions (E2)	
7	1st Order Conjugate Base Dissociation Reactions (E1CB)	
8	Electrophilic Addition Reactions-1	
9	MIDTERM EXAM	
10	Electrophilic Addition Reactions-2	
11	Nucleophilic Addition Reactions-1	
12	Nucleophilic Addition Reactions-2	
13	Aromatic Electrophilic Substitution Reactions-1	
14	Aromatic Electrophilic Substitution Reactions-2	
15	FINAL	

Assessment			
Evaluation Criteria	Activity	Custom	Contribution to Success Grade (%)
	Midterm Exams	1	40
	Quizzes		
	Assignments		
	Projects		
	Term Paper		
	Laboratory		
	Other		
	Final Exam	1	60
	Sum:		100
Remarks			

Content Design and Subject Weight (%)	Mathematics and Basic Sciences	100
	Engineering Sciences	
	Social Sciences	
	Health Sciences	
	Educational Sciences	
	Culture and Art Sciences	
	Design Information	

Workload (ECTS) Calculation

Events	Number	Duration (Hours)	Total workload (Hours)
Fieldwork			
Midterm Exam Application	1	3	3
Self-Study (including pre-class and exam preparation)	1	10	10
Make-up Exam	1	3	3
Experiment and Observation			
Class Participation (Theory)	14	4	56
Homework			
Final Exam Practice	1	3	3
Laboratory			
Article Review			
Writing an Article			
Reading	10	1	10
Case Study			
Performance	14	1	14
Problem Solution			
Project Preparation			
Project Submission			
Quiz			
Report Preparation			
Submitting Reports			
Role/Drama Work			
Seminar			
Oral Exam			
Team/Group Work			
Argument			
Application/Practice			
Other			
TOTAL WORKLOAD:			99
ECTS CREDITS OF THE COURSE: (The number obtained as a result of Total Workload/25 is calculated by rounding to the whole number.)			4

		Program Outcomes (PO)										
		1	2	3	4	5	6	7	8	9	10	11
Learning Outcomes (LO) (Course Outcomes)												
1	They learn the mechanisms of nucleophilic substitution and separation reactions.	5	4	5	3	5	4	4	3	4	2	3
2	They learn the mechanisms of electrophilic and nucleophilic addition reactions.	5	5	3	4	4	3	5	4	4	3	3
3	They learn the mechanisms of aromatic electrophilic substitution reactions.	5	4	4	5	4	4	3	3	4	2	3
4	Relating reaction mechanisms to functional groups and proposing reaction mechanisms for new products.	5	4	4	5	3	5	4	5	4	2	3
5	Developing the ability to predict and interpret new reactions	5	4	5	3	4	5	4	3	4	5	3

Course Information								
Course Code	T	P	L	C	ECTS	Type C/E	Language TR/ENG etc.	Year/Semester
CHEM2130	2	0	0	2	4	C	TR	1/SPRING
Course Name (Turkish)	Temiz Enerji Kaynakları							
Course Name (English)	Renewable Energy Sources							

Unit/Program	Chemistry Department/Undergraduate Program			
Course Prerequisite	No			
Course Objectives	To provide information about renewable energy production systems.			
Course Outline	Energy, energy production in the world, environmental problems caused by fossil energy sources, renewable energy sources			
Textbook/ Material / Resources	-Alternative Energy Sources: Solar Energy, Wind Energy, Biomass Energy, Biogas Energy, Biodiesel, Fuel Cells, Boron Energy Author: Mustafa Acaroğlu Publishing House: Nobel Academic Publishing - Onurbaş Avcıoğlu, A., Türker U., Atasoy, Z. And D. Koçtürk, 2011. Agricultural Origin Renewable Energies-Biofuels. Nobel Publications.			
Internship Status	No			
Course Precedents				
University Name	Program Name	Course Name	T-P-L-C; ECTS	Type
Ankara İUniversity	Agriculture	Inorganic Chemistry II	4-0-2-0-7	C
The instructor who proposed the course (Title, Name and Surname)			Signature	
Prof. Dr. Mustafa KARATEPE				
Instructors who can teach the course (Title, Name and Surname)			Signature	

Academic justification for the opening of the course? (The effect of course outcomes on program outcomes, etc.)
To provide information about energy and production systems, which are basic needs of humanity, and to draw attention to clean energy.

Brief explanation of the course (theoretical lecture, applications, laboratory, studio, off-campus activity, using software, etc.)
The course is aimed at gaining theoretical knowledge.

External Stakeholder Opinions About the Course (It is expected that the opinions to be obtained from the business world that will employ your graduates or from real or legal persons outside the University who have expertise on the subject of the course will be specified. Proof documents must be attached to this form.)		
Stakeholder Name		Opinion (It should be given as a summary, it should not exceed two lines.)
Weekly Course Content Distribution		
We ek	Theory	Application/ Laboratory

1	What is Clean Energy? What are Clean Energy Sources?	
2	Classification of Energy Sources and Importance of Renewable Energy Sources	
3	Biomass Energy	
4	Turkey's Biomass Potential	
5	Biodiesel	
6	Advantages and Disadvantages of Biodiesel	
7	Biodiesel Production Technologies 1	
8	Biodiesel Production Technologies 2	
9	MIDTERM EXAM	
10	Bioethanol	
11	History of Bioethanol Use, Bioethanol Production in Turkey and the World	
12	Biological Production of Ethanol and Petrochemical Ethanol Synthesis 1	
13	Biological Production of Ethanol and Petrochemical Ethanol Synthesis 2	
14	Bioethanol Groups According to the Type of Raw Material Produced (Bioethanol Generations)	
15	FINAL	

Assessment			
Evaluation Criteria	Activity	Custom	Contribution to Success Grade (%)
	Midterm Exams	1	40
	Quizzes		
	Assignments		
	Projects		
	Term Paper		
	Laboratory		
	Other		
	Final Exam	1	60
	Sum:		100
Remarks			

Content Design and Subject Weight (%)	Mathematics and Basic Sciences	80
	Engineering Sciences	20
	Social Sciences	
	Health Sciences	
	Educational Sciences	
	Culture and Art Sciences	
	Design Information	

Workload (ECTS) Calculation

Events	Number	Duration (Hours)	Total workload (Hours)
Fieldwork	1	1	1
Midterm Exam Application	3	10	30
Self-Study (including pre-class and exam preparation)	1	2	2
Make-up Exam			
Experiment and Observation	10	2	20
Class Participation (Theory)			
Homework	1	2	2
Final Exam Practice			
Laboratory			
Article Review			
Writing an Article	10	1	10
Reading			
Case Study			
Performance	10	1	10
Problem Solution			
Project Preparation			
Project Submission			
Quiz			
Report Preparation			
Submitting Reports			
Role/Drama Work			
Seminar			
Oral Exam			
Team/Group Work	10	2	20
Argument			
Application/Practice			
Other			
TOTAL WORKLOAD:			95
ECTS CREDITS OF THE COURSE: <i>(The number obtained as a result of Total Workload/25 is calculated by rounding to the whole number.)</i>			4

[illegible]

Course Information								
Course Code	T	P	L	C	ECTS	Type C/E	Language TR/ENG etc.	Year/Semester
CHEM2128	4	0	0	4	5	C	TR	1/SPRING
Course Name (Turkish)	Anorganik Kimya II							
Course Name (English)	Inorganic Chemistry II							

Unit/Program	Chemistry Department/Undergraduate Program			
Course Prerequisite	No			
Course Objectives	Learning the concepts of inorganic chemistry			
Course Outline	Symmetry and its applications in chemistry, molecular orbital theory, Acids and Bases, acidity, basicity and solvent systems in nonaqueous media			
Textbook/ Material / Resources	Inorganic Chemistry, Garly L.Miessler, Donald A.Tarr, Translator: Translation Editors: Nurcan Karacan,Perihan Gurkan, Palme Publications, 2009, Ankara Inorganic Chemistry Namik. K. Tunali, Saim Ozkar, Gazi Bookstore, 6th Edition, 2007 Ankara			
Internship Status	No			
Course Precedents				
University Name	Program Name	Course Name	T-P-L-C; ECTS	Type
Ege University	Chemistry	Inorganic Chemistry	4-0-2-0-7	C
Yıldız Teknik University	Chemistry	Inorganic Chemistry	4-0-4-0-6	C
Eskişehir Osmangazi University	Chemistry	Inorganic Chemistry	4-0-4-0-6	C
The instructor who proposed the course (Title, Name and Surname)			Signature	
Prof. Dr. Sinan SAYDAM				
Instructors who can teach the course (Title, Name and Surname)			Signature	
Prof. Dr. Sinan SAYDAM, Prof. Dr. Ayşegül YAZICI, Prof. Dr Memet ŞEKERCİ, Doç. Dr. Kenan KORAN				

Academic justification for the opening of the course? (The effect of course outcomes on program outcomes, etc.)

Brief explanation of the course (theoretical lecture, applications, laboratory, studio, off-campus activity, using software, etc.)

External Stakeholder Opinions About the Course (It is expected that the opinions to be obtained from the business world that will employ your graduates or from real or legal persons outside the University who have expertise on the subject of the course will be specified. Proof documents must be attached to this form.)	
Stakeholder Name	Opinion (It should be given as a summary, it should not exceed two lines.)
Weekly Course Content Distribution	

Week	Theory	Application/ Laboratory
1	Symmetry and symmetry elements	
2	Symmetry and point groups	
3	Symmetry character tables	
4	Symmetry applications	
5	Molecular orbital theory (MOT)	
6	MOT in monoatomic molecules	
7	MOT in polyatomic molecules	
8	MIDTERM EXAM	
9	Interparticle Interactions: Other Interactions, Dipole, Induced Dipole Interactions and Intermolecular and Intramolecular Hydrogen Bonding	
10	Interparticle Interactions: Results of Interparticle Interactions	
11	Acids and Bases: Acid-Base Definitions, Acid-Base Properties	
12	Acids and Bases: Acids and Bases in Aqueous Media,	
13	Solvent Systems and Acidity and Basicity	
14	Hard and Soft Acids and Bases	
15	FINAL	

Assessment			
Evaluation Criteria	Activity	Custom	Contribution to Success Grade (%)
	Midterm Exams	1	40
	Quizzes		
	Assignments		
	Projects		
	Term Paper		
	Laboratory		
	Other		
	Final Exam	1	60
	Sum:		100
Remarks			

Content Design and Subject Weight (%)	Mathematics and Basic Sciences	100
	Engineering Sciences	
	Social Sciences	
	Health Sciences	
	Educational Sciences	
	Culture and Art Sciences	
	Design Information	

Workload (ECTS) Calculation

Events	Number	Duration (Hours)	Total workload (Hours)
Fieldwork			
Midterm Exam Application	1	3	3
Self-Study (including pre-class and exam preparation)	2	20	40
Make-up Exam	1	3	3
Experiment and Observation			
Class Participation (Theory)	14	4	56
Homework			
Final Exam Practice	1	3	3
Laboratory			
Article Review			
Writing an Article			
Reading	10	1	10
Case Study			
Performance			
Problem Solution	14	1	14
Project Preparation			
Project Submission			
Quiz			
Report Preparation			
Submitting Reports			
Role/Drama Work			
Seminar			
Oral Exam			
Team/Group Work			
Argument	7	1	7
Application/Practice			
Other			
TOTAL WORKLOAD:			136
ECTS CREDITS OF THE COURSE: (The number obtained as a result of Total Workload/25 is calculated by rounding to the whole number.)			5

		Program Outcomes (PO)										
Learning Outcomes (LO) (Course Outcomes)		1	2	3	4	5	6	7	8	9	10	11
1	Knows the principles and approaches of inorganic chemistry.	5	5	5	4	4	4	4	5	3	4	4
2	Students are familiar with the applications of the concept of symmetry in chemistry.	5	4	5	3	5	5	5	4	4	4	2
3	Students are familiar with the applications of molecular orbital theory to molecules.	4	3	4	5	5	2	3	3	3	3	1
4	Students are knowledgeable about the concepts of acidity and basicity in chemical reactions and acidity and basicity in nonaqueous media.	5	4	3	5	5	4	1	5	5	5	1
5	Students will learn about inorganic chemistry and other chemistry fields and their applications in daily life.	5	5	4	4	4	4	2	3	3	3	1

Course Information								
Course Code	T	P	L	C	ECTS	Type C/E	Language TR/ENG etc.	Year/Semester
CHEM2122	4	0	0	4	5	C	TR	1/SPRING
Course Name (Turkish)	Analitik Kimya II							
Course Name (English)	Analytical Chemistry II							

Unit/Program	Chemistry Department/Undergraduate Program
Course Prerequisite	No
Course Objectives	To teach quantitative analysis methods with a wide range of applications in analytical chemistry and the analyses performed with these methods, analytical thinking, the ability to theoretically examine chemical analyses, and the purposeful evaluation of the obtained data.
Course Outline	Gravimetric Analysis and applications, Mono and polyproton acid systems, Titrimetric methods; Complex Acid-Base Systems and Titration Curves, Precipitation Titrimetry, Principles of Neutralization Titrations, Applications of Neutralization Titrations, Complexation Reactions and Titrations, Introduction to Electrochemistry, Applications of Standard Electrode Potentials, Applications of Oxidation/Reduction Titrations,
Textbook/ Material/ Resources	Analytical Chemistry - Fundamental Principles, 8th Edition; D. A. Skoog, D. M. West, F. J. Holler, S. R. Crouch. Thomson Pub.. US. (2004); Translation Editors: E.Kılıç and H. Yılmaz-Bilim Publishing- Ankara
Internship Status	No

Course Precedents				
University Name	Program Name	Course Name	T-P-L-C; ECTS	Type
Gazi University	Chemistry	Analytical Chemistry II	4-0-0-4- 6	C
Yıldız Teknik University	Chemistry	Analytical Chemistry II	4-0-0-4- 4	C
Namık Kemal University	Chemistry	Analytical Chemistry II	4-0-0-4- 4	C
The instructor who proposed the course (Title, Name and Surname)			Signature	
Prof. Dr. Habibe Özmen				
Instructors who can teach the course (Title, Name and Surname)			Signature	
Prof. Dr. Ali Ölçücü, Prof. Dr. Mehmet Yaman				

Academic justification for the opening of the course? (The effect of course outcomes on program outcomes, etc.)
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Brief explanation of the course (theoretical lecture, applications, laboratory, studio, off-campus activity, using software, etc.)

External Stakeholder Opinions About the Course (It is expected that the opinions to be obtained from the business world that will employ your graduates or from real or legal persons outside the University who have expertise on the subject of the course will be specified. Proof documents must be attached to this form.)	
Stakeholder Name	Opinion (It should be given as a summary, it should not exceed two lines.)

Weekly Course Content Distribution		
Wee	Theory	Application/

k		Laboratory
1	Gravimetric Analysis and its applications	
2	Multiproton acid-base equilibria	
3	Multiproton acid-base equilibria	
4	Basic principles and applications of volumetric analysis	
5	Principles of Neutralization Titrations	
6	Titration Curves for Complex Acid-Base Systems	
7	Titrimetric Methods, Precipitation Titrimetry	
8	Titrimetric Methods, Precipitation Titrimetry	
9	MIDTERM EXAM	
10	Complexation Reactions and Titrations	
11	Introduction to Electrochemistry, Applications of Standard Electrode Potentials	
12	Introduction to Electrochemistry, Applications of Standard Electrode Potentials	
13	Applications of Oxidation-Reduction Titrations	
14	Applications of Oxidation-Reduction Titrations	
15	FINAL	

Assessment			
Evaluation Criteria	Activity	Custom	Contribution to Success Grade (%)
	Midterm Exams	1	40
	Quizzes		
	Assignments		
	Projects		
	Term Paper		
	Laboratory		
	Other		
	Final Exam	1	60
	Sum:		100
Remarks			

Content Design and Subject Weight (%)	Mathematics and Basic Sciences	100
	Engineering Sciences	
	Social Sciences	
	Health Sciences	
	Educational Sciences	
	Culture and Art Sciences	
	Design Information	

Workload (ECTS) Calculation

Events	Number	Duration (Hours)	Total workload (Hours)
Fieldwork			
Midterm Exam Application	1	2	2
Self-Study (including pre-class and exam preparation)	10	4	40
Make-up Exam	1	2	2
Experiment and Observation			
Class Participation (Theory)	14	4	56
Homework			
Final Exam Practice	1	2	2
Laboratory			
Article Review			
Writing an Article			
Reading	10	1	10
Case Study			
Performance			
Problem Solution	14	1	14
Project Preparation			
Project Submission			
Quiz			
Report Preparation			
Submitting Reports			
Role/Drama Work			
Seminar			
Oral Exam			
Team/Group Work			
Argument	7	1	7
Application/Practice			
Other			
TOTAL WORKLOAD:			133
ECTS CREDITS OF THE COURSE: (The number obtained as a result of Total Workload/25 is calculated by rounding to the whole number.)			5

		Program Outcomes (PO)										
Learning Outcomes (LO) (Course Outcomes)		1	2	3	4	5	6	7	8	9	10	11
1	It determines the applications of gravimetric, volumetric and electroanalytical methods among quantitative analysis methods and the relative amounts of analytes in the sample.	5	5	5	4	2	4	4	3	4	2	1
2	To learn the principles and types of titrimetric methods and to be able to draw titration curves.	5	5	5	4	3	4	4	3	4	2	1
3	Gaining analytical thinking perspective on chemical problems	5	5	5	4	2	4	4	3	4	2	1
4	Learn how to solve multiple equilibrium problems that occur in complex systems.	5	5	5	4	2	4	4	3	4	2	1
5	Compares the advantages and disadvantages of relevant analytical techniques, and gains the ability to achieve good analysis results in a competent, safe and confident manner.	5	5	5	4	2	5	4	3	4	2	1

Course Information								
Course Code	T	P	L	C	ECTS	Type C/E	Language TR/ENG etc.	Year/Semester
CHEM2132	4	0	0	4	5	C	TR	1/SPRING
Course Name (Turkish)	Organik Kimya-2							
Course Name (English)	Organic Chemistry-2							

Unit/Program	Chemistry Department/Undergraduate Program
Course Prerequisite	No
Course Objectives	To teach the general properties of organic molecules with carbonyl groups, their production methods, and to teach the reactions of active methylene compounds. To provide information about the acidity of carboxylic acids and the basicity of amines. To provide basic knowledge about carbohydrates, amino acids, proteins, lipids and nucleic acids.
Course Outline	Introduction to Carbonyl Chemistry. General properties; Aldehydes and ketones, General properties, Preparation methods and Reactions; Active methylene, reactions of carbanions and enolates; Carboxylic acids, General properties, Preparation methods and Reactions; Esters, General properties, Preparation methods and Reactions; Acid halides and anhydrides, General properties, Preparation methods and Reactions; Amides, Preparation methods and Reactions; Amines, General properties, Preparation methods and Reactions; Carbohydrates, Amino Acids and Lipids and Basic Information about Nucleic Acid Chemistry.
Textbook/ Material / Resources	1. Organic Chemistry, (7th edition) Graham Solomons, Craig Fryhle, Translation Editor: Güral Okay Yılmaz Yıldırım, Literatür Publishing, Istanbul. 2. Organic Chemistry, Translation Editor: Tahsin Uyar (Harold Hart, Leslie E. Craine, David J. Hart, Christopher M. Hadad), 12th edition, Palme Publishing. 3. Organic Chemistry, Jonathan Clayden, Nick Greeves, Stuart Warren, Peter Wothers, Oxford Chemistry Primer, 2001.
Internship Status	No

Course Precedents				
University Name	Program Name	Course Name	T-P-L-C; ECTS	Type
Ege University	Chemistry	Organic Chemistry-2	3-0-4-0-6	C
İnönü University	Chemistry	Organic Chemistry-2	4-0-4-0-6	C
Eskişehir Osmangazi University	Chemistry	Organic Chemistry-2	4-0-4-5	C
The instructor who proposed the course (Title, Name and Surname)			Signature	
Prof. Dr. Süleyman Servi				
Instructors who can teach the course (Title, Name and Surname)			Signature	
Prof. Dr. Süleyman Servi				
Prof. Dr. Hülya Tuncer				

Academic justification for the opening of the course? (The effect of course outcomes on program outcomes, etc.)
1. To provide the ability to establish relationships between the general properties of functional groups in organic molecules and functional groups, 2. To explain the reactions of active methylene compounds, 3. To learn the properties of organic acids and bases, 4. To have information about amines and carboxylic acid derivatives, 5. To provide basic information about the chemistry of carbohydrates, lipids, amino acids and nucleic acids.

Brief explanation of the course (theoretical lecture, applications, laboratory, studio, off-campus activity, using software, etc.)
It will be explained theoretically with computer support.

External Stakeholder Opinions About the Course (It is expected that the opinions to be obtained from the business world that will employ your graduates or from real or legal persons outside the University who have expertise on the subject of the course will be specified. Proof documents must be attached to this form.)

Stakeholder Name	Opinion (It should be given as a summary, it should not exceed two lines.)

Weekly Course Content Distribution

We ek	Theory	Application/ Laboratory
1	Introduction to Carbonyl Chemistry. General properties	
2	Aldehydes and ketones	
3	General properties of aldehydes and ketones, their formation reactions	
4	Reactions of aldehydes and ketones	
5	Reactions of active methylene, carbanions and enolates	
6	Carboxylic acids, their general properties, their formation reactions	
7	Reactions of carboxylic acids	
8	Esters, General Properties, Preparation Reactions, Their Reactions	
9	MIDTERM EXAM	
10	Acid halides and anhydrides, General Properties, Preparation Reactions and Their Reactions	
11	Amids, General Properties, Preparation Reactions, Their Reactions	
12	Amines, General Properties, Preparation Reactions	
13	Reactions of Amines- MAKE-UP EXAM	
14	Basic Information About Carbohydrates, Amino Acids	
15	Basic Information About Lipids and Nucleic Acid Chemistry	

Assessment

Evaluation Criteria	Activity	Custom	Contribution to Success Grade (%)
	Midterm Exams	1	40
	Quizzes		
	Assignments		
	Projects		
	Term Paper		
	Laboratory		
	Other		
	Final Exam	1	60
	Sum:		100
Remarks			

Content Design and Subject Weight (%)	Mathematics and Basic Sciences	40
	Engineering Sciences	30

	Social Sciences	
	Health Sciences	30
	Educational Sciences	
	Culture and Art Sciences	
	Design Information	

Workload (ECTS) Calculation			
Events	Number	Duration (Hours)	Total workload (Hours)
Fieldwork			
Midterm Exam Application	1	3	3
Self-Study (including pre-class and exam preparation)	10	2	20
Make-up Exam	1	3	3
Experiment and Observation			
Class Participation (Theory)	14	4	56
Homework			
Final Exam Practice	1	3	3
Laboratory			
Article Review			
Writing an Article			
Reading	10	1	10
Case Study			
Performance			
Problem Solution	14	1	14
Project Preparation			
Project Submission			
Quiz			
Report Preparation			
Submitting Reports			
Role/Drama Work			
Seminar			
Oral Exam			
Team/Group Work			
Argument	10	1	10
Application/Practice			
Other			
TOTAL WORKLOAD:			119
ECTS CREDITS OF THE COURSE: (The number obtained as a result of Total Workload/25 is calculated by rounding to the whole number.)			5

		Program Outcomes (PO)										
		1	2	3	4	5	6	7	8	9	10	11
Learning Outcomes (LO) (Course Outcomes)												
1	Recognize aldehydes, ketones and compounds	4	2	1	1	2	2	1	2	2	3	2

	derived from them.											
2	Learn the properties and reactions of active methylene compounds and enolates.	3	2	2	1	2	2	1	1	2	3	2
3	Distinguish carboxylic acids, esters, acid halides and acid anhydrides.	5	3	4	2	3	3	1	2	3	3	3
4	Distinguish esters, acid halides and acid anhydrides. Recognize amines and amides.	5	3	4	2	3	3	1	1	3	3	3
5	Have information about the structural properties of biochemical molecules	5	4	3	3	3	3	2	3	4	3	4

Course Information								
Course Code	T	P	L	C	ECTS	Type C/E	Language TR/ENG etc.	Year/Semester
YDİ208	2	0	0	2	2	C	TR	2/SPRING
Course Name (Turkish)	Yabancı Dil II							
Course Name (English)	Foreign Language II							

Unit/Program	Chemistry Department/Undergraduate Program			
Course Prerequisite	No			
Course Objectives	This course aims to help students: Have basic grammar in English at A2 level for undergraduate level, Understand short passages they listen to, Be able to converse using basic patterns, Understand what they read, Be able to express themselves in writing.			
Course Outline	Using the conjunction 'If' to express general truths, plans and predictions for the future, unreal events at the moment of speaking, and conditional sentence structures related to past events; learning how to use direct sentences, questions, requests, and orders through indirect speech; making passive sentences in positive, negative, and question structures related to present, future, and past tenses; using relative clauses with 'that, who, which'.			
Textbook/ Material/ Resources	1. Full Steam Ahead, 8th ed., Gündüz Education and Publishing, Ankara. 2. Turkish-English Dictionary			
Internship Status	No			
Course Precedents				
University Name	Program Name	Course Name	T-P-L-C; ECTS	Type
The instructor who proposed the course (Title, Name and Surname)			Signature	
Uzaktan Eğitim Koordinatörü				
Instructors who can teach the course (Title, Name and Surname)			Signature	

Academic justification for the opening of the course? (The effect of course outcomes on program outcomes, etc.)
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Brief explanation of the course (theoretical lecture, applications, laboratory, studio, off-campus activity, using software, etc.)

External Stakeholder Opinions About the Course (It is expected that the opinions to be obtained from the business world that will employ your graduates or from real or legal persons outside the University who have expertise on the subject of the course will be specified. Proof documents must be attached to this form.)	
Stakeholder Name	Opinion (It should be given as a summary, it should not exceed two lines.)

Weekly Course Content Distribution		
Week	Theory	Application/ Laboratory
1	Teori	
2	You will find a better job if you learn English a. possible happenings in the future: if	
3	You will find a better job if you learn English a. talking about general truths, causes and effects, automatic or habitual results: zero type	
4	You will find a better job if you learn English a. unreal present with type 2 b. unreal past with type 3 c. mixed types	
5	She said that a. direct and indirect/ reported speeches	
6	She said that a. direct and indirect/ reported speeches	
7	General Revision	
8	Quiz	
9	It was written by a. focusing on actions: passive voice	
10	Genel uygulama	
11	It was written by a. focusing on actions: passive voice	
12	Relative Clauses a. the use of relative clauses	
13	Causatives, Quiz	
14	Ders içeriğinin ve konuların kısa bir değerlendirilmesi	
15	GENEL SINAV	

Assessment			
Evaluation Criteria	Activity	Custom	Contribution to Success Grade (%)
	Midterm Exams	1	20
	Quizzes		
	Assignments		
	Projects		
	Term Paper		
	Laboratory		
	Other		
	Final Exam	1	80
	Sum:		100
Remarks			

Content Design and Subject Weight (%)	Mathematics and Basic Sciences	
	Engineering Sciences	
	Social Sciences	100
	Health Sciences	
	Educational Sciences	
	Culture and Art Sciences	
	Design Information	

Workload (ECTS) Calculation			
Events	Number	Duration (Hours)	Total workload (Hours)
Fieldwork			
Midterm Exam Application			
Self-Study (including pre-class and exam preparation)			
Make-up Exam			
Experiment and Observation			
Class Participation (Theory)			
Homework			
Final Exam Practice			
Laboratory			
Article Review			
Writing an Article			
Reading			
Case Study			
Performance			
Problem Solution			
Project Preparation			
Project Submission			
Quiz			
Report Preparation			
Submitting Reports			
Role/Drama Work			
Seminar			
Oral Exam			
Team/Group Work			
Argument			
Application/Practice			
Other			
TOTAL WORKLOAD:			
ECTS CREDITS OF THE COURSE: <i>(The number obtained as a result of Total Workload/25 is calculated by rounding to the whole number.)</i>			2

Program Outcomes (PO)											
Learning Outcomes (LO) (Course Outcomes)											
1	Have sufficient foreign language knowledge in	5	5	5	3	2	5	3	5	4	5

	the field											1
2	Can comprehend long messages	5	5	5	2	2	2	4	2	2	2	1
3	Can comprehend long, everyday texts	5	4	5	1	1	1	2	1	5	2	1
4	Can write long, advanced notes and messages	5	5	4	5	3	4	5	5	3	4	1

Course Information								
Course Code	T	P	L	C	ECTS	Type C/E	Language TR/ENG etc.	Year/Semester
TRD110	2	0	0	2	2	C	TR	2/SPRING
Course Name (Turkish)	Atatürk İlke ve İnkılapları Tarihi I							
Course Name (English)	History of Atatürk's Principles and Revolutions I							

Unit/Program	Chemistry Department/Undergraduate Program
Course Prerequisite	No
Course Objectives	To ensure that students gain historical and civic awareness, are equipped with general cultural knowledge, and are aware of the republican period and its values.
Course Outline	Ataturk's Principles and Revolutions. Social, cultural, political and economic approaches and structure of the Republic of Türkiye.
Textbook/ Material/ Resources	1. Higher Education Council Publications, Atatürk's Principles and Revolution History I/2 2. Speeches, Speeches and Statements, E. Semih Yalçın, Atatürk's National Foreign Policy, Mehmet Gönlübol and Others, Turkish Foreign Policy with Events, Fahir Armaoğlu, 20th Century Political History
Internship Status	No

Course Precedents				
University Name	Program Name	Course Name	T-P-L-C; ECTS	Type
The instructor who proposed the course (Title, Name and Surname)			Signature	
Uzaktan Eğitim Koordinatörü				
Instructors who can teach the course (Title, Name and Surname)			Signature	

Academic justification for the opening of the course? (The effect of course outcomes on program outcomes, etc.)
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Brief explanation of the course (theoretical lecture, applications, laboratory, studio, off-campus activity, using software, etc.)

External Stakeholder Opinions About the Course (It is expected that the opinions to be obtained from the business world that will employ your graduates or from real or legal persons outside the University who have expertise on the subject of the course will be specified. Proof documents must be attached to this form.)		
Stakeholder Name		Opinion (It should be given as a summary, it should not exceed two lines.)
Weekly Course Content Distribution		
Week	Theory	Application/

		Laboratory
1	Reforms in the political field, the abolition of the sultanate and the declaration of the republic	
2	Renewal of elections and the establishment of the People's Party	
3	Abolition of the Caliphate	
4	Reforms in the field of law (1921 Constitution, 1924 Constitution, Civil Code and Penal Code)	
5	Reforms in the field of education and culture (National Education Organization, Public Education, Foreign Schools, Alphabet Revolution, Turkish Language and History Societies)	
6	Reforms in the social field (Women's Rights, Dress Code, Closure of Dervish Lodges and Zawiya's, Changes in Calendar, Hours, Measurement and Weight Units)	
7	Regulations in the field of health and social assistance	
8	Regulations in the field of economy (industry and trade, industrial incentive law, business bank, agricultural and transportation activities)	
9	MIDTERM EXAM	
10	Regulations made in the economic field, (Fiscal Policy, Customs and Taxes, Turkish Currency Protection Law, census and DIE, statism and planned development)	
11	Multi-party system experiments	
12	Free Republican Party	
13	Turkish Revolution and reactions to the republic, foreign policy during the Atatürk period	
14	MAKE-UP EXAM	
15	FINAL	

Assessment			
Evaluation Criteria	Activity	Custom	Contribution to Success Grade (%)
	Midterm Exams	1	20
	Quizzes		
	Assignments		
	Projects		
	Term Paper		
	Laboratory		
	Other		
	Final Exam	1	80
	Sum:		100
Remarks			
Content Design and Subject Weight (%)	Mathematics and Basic Sciences		
	Engineering Sciences		
	Social Sciences	100	

	Health Sciences	
	Educational Sciences	
	Culture and Art Sciences	
	Design Information	

Workload (ECTS) Calculation			
Events	Number	Duration (Hours)	Total workload (Hours)
Fieldwork			
Midterm Exam Application			
Self-Study (including pre-class and exam preparation)			
Make-up Exam			
Experiment and Observation			
Class Participation (Theory)			
Homework			
Final Exam Practice			
Laboratory			
Article Review			
Writing an Article			
Reading			
Case Study			
Performance			
Problem Solution			
Project Preparation			
Project Submission			
Quiz			
Report Preparation			
Submitting Reports			
Role/Drama Work			
Seminar			
Oral Exam			
Team/Group Work			
Argument			
Application/Practice			
Other			
TOTAL WORKLOAD:			
ECTS CREDITS OF THE COURSE: (The number obtained as a result of Total Workload/25 is calculated by rounding to the whole number.)			2

		Program Outcomes (PO)					6	7	8	9	10	11
Learning Outcomes (LO) (Course Outcomes)		1	2	3	4	5						
1	Students learn about the efforts of the Republic of Türkiye, which was established in place of the Ottoman Empire, to modernize and increase its level of welfare, to ensure a self-sufficient development process, and to democratize and establish the rule of law.	5	5	5	3	2	5	3	5	4	5	1